

Claims:

1 1. A method of operating a wireless communication
2 system to service high data rate forward link transmissions
3 for a mobile station, the method comprising:

4 determining an active set of base stations for servicing
5 the mobile station;

6 for each of the active set of base stations, downloading
7 a plurality of blocks of data from a central buffer, wherein
8 each block of data of the plurality of blocks of data
9 includes a respective sequence number, and wherein a first
10 block of data of the plurality of blocks of data includes an
11 initial sequence number,

12 transmitting blocks of data from a serving base station
13 of the active set of base stations to the mobile station;

14 receiving a sequence number from the mobile station for
15 each block of data successfully received by the mobile
16 station; and

17 when the sequence number of a block of data successfully
18 received by the mobile station exceeds the initial sequence
19 number by a threshold value, downloading a next plurality of
20 blocks of data from a central buffer to each base station of
21 the active set of base stations.

1 2. The method of claim 1, wherein the central buffer
2 is serviced by a base station controller, and wherein the
3 base station controller services the plurality of base
4 stations.

1 3. The method of claim 2, wherein the central buffer
2 is serviced by a services gateway switching node that
3 services the plurality of base stations.

1 4. The method of claim 1, wherein only one base
2 station of the active set of base stations services forward
3 link transmissions to the mobile station at any particular
4 time.

1 5. The method of 4, wherein:
2 the mobile station reports the sequence number of a
3 successfully received block of data to its serving base
4 station; and
5 determining that the sequence number of a block of data
6 successfully received by the mobile station exceeds the
7 initial sequence number by a threshold value is determined by
8 the mobile station's serving base station.

1 6. The method of claim 1, wherein the wireless
2 communication system supports the 1xEV-DO standard.

1 7. The method of claim 1, wherein the wireless
2 communication system supports the High Speed Downlink Packet
3 Access standard.

1 8. A method of managing the contents of a plurality of
2 data buffers in a wireless communication system to service
3 forward link data transmissions for a mobile station, the
4 method comprising:

5 receiving data in a central buffer of a network element
6 of the wireless communication system element, wherein the
7 network element manages a plurality of base stations of the
8 wireless communication system;

9 downloading a plurality of blocks of data from the
10 central buffer to each of a plurality of distributed buffers
11 resident in a respective plurality of base stations forming
12 an active set of base stations servicing the mobile station;

13 transmitting blocks of data from a serving base station
14 of the active set of base stations to the mobile station;

15 determining that distributed buffer refresh is required;
16 and

17 downloading a next plurality of blocks of data from the
18 central buffer to each of the plurality of distributed
19 buffers resident in the active set of base stations servicing
20 the mobile station.

1 9. The method of claim 8, wherein:

2 the central buffer supports centralized link layer
3 buffering operations; and

4 the plurality of distributed buffers support distributed
5 link layer buffering operations.

1 10. The method of claim 9, wherein the central buffer
2 and the plurality of distributed buffers support the radio
3 link protocol.

1 11. The method of claim 8, wherein only one base
2 station of the active set of base stations services forward
3 link transmissions to the mobile station at any particular
4 time.

1 12. The method of claim 8, wherein the network element
2 is a base station controller.

1 13. A method of managing the contents of a plurality of
2 data buffers in a wireless communication system to service
3 forward link data transmissions for a mobile station, the
4 method comprising:

5 receiving data in a central buffer of a network element
6 of the wireless communication system, wherein the network
7 element services a plurality of base stations of the wireless
8 communication system;

9 downloading a plurality of blocks of data from the
10 central buffer to each of a plurality of distributed buffers
11 resident in a respective plurality of base stations that
12 define an active set of base stations servicing the mobile
13 station, wherein each block of the plurality of blocks of
14 data includes a respective sequence number, and wherein a

15 first block of data of the plurality of blocks of data
16 includes an initial sequence number;

17 transmitting blocks of data from a serving base station
18 of the active set of base stations to the mobile station;

19 for each block of data successfully received by the
20 mobile station, receiving confirmation from the mobile
21 station that includes a sequence number of the successfully
22 received block of data; and

23 when the sequence number of a block of data successfully
24 received by the mobile station exceeds the initial sequence
25 number by a threshold value, downloading a next plurality of
26 blocks of data from a central buffer to each of the plurality
27 of distributed buffers resident in the plurality of base
28 stations that define the active set of base stations
29 servicing the mobile station base.

1 14. The method of claim 13, wherein the central buffer
2 is serviced by a base station controller that services the
3 plurality of base stations.

1 15. The method of claim 13, wherein the central buffer
2 is serviced by a services gateway switching node that
3 services the plurality of base stations.

1 16. The method of claim 13, wherein only one base
2 station of the active set of base stations may be the serving
3 base station at any particular time.

1 17. The method of claim 13, wherein:
2 the mobile station reports the sequence number of a
3 successfully received block of data to the serving base
4 station; and
5 determining that the sequence number of a block of data
6 successfully received by the mobile station exceeds the
7 initial sequence number by a threshold value is determined by
8 the serving base station.

1 18. A base station controller comprising:
2 a packet data serving node interface;
3 at least one base station interface that interfaces the
4 base station controller to a plurality of base stations; and
5 at least one digital processor coupled to the Radio
6 Frequency unit that executes software instructions causing
7 the base station controller to:
8 determine an active set of base stations for servicing
9 the mobile station;
10 download a plurality of blocks of data to each base
11 station of the active set of base stations, wherein each
12 block of data of the plurality of blocks of data includes a
13 respective sequence number, and wherein a first block of data
14 of the plurality of blocks of data includes an initial
15 sequence number;

16 receive an indication from a serving base station of the
17 active set of base stations that a data refresh is required;
18 and

19 download a next plurality of blocks of data to each base
20 station of the active set of base stations.

1 19. The base station controller of claim 18, wherein
2 only one base station of the active set of base stations
3 services forward link transmissions to the mobile station at
4 any particular time.

1 20. The base station controller of claim 18, wherein
2 the base station controller supports the 1xEV-DO standard.